

WHAT IS CLAIMED IS:

1. An information recording medium comprising a user area, and a spare area including a replacement area, wherein the replacement area may be used instead of a defective area in the user area,

wherein the user area and the spare area include a plurality of sectors;

each of the plurality of sectors includes a user data area for recording user data, and an attribute data area for recording defect replacement allowance attribute data; and

the defect replacement allowance attribute data indicates whether recording of the user data has been executed in a state that the execution of a defect replacement process is allowed, wherein in the defect replacement process, the defective area in the user area is replaced with the replacement area in the spare area.

2. An information recording medium according to claim 1, wherein real-time data is recorded as the user data in each of one or more sectors of the plurality of sectors, real-time reproduction being required for the real-time data, and

in each of the one or more sectors, defective replacement allowance attribute data having a first attribute value indicating that the recording of the user data has not been executed in the state that the execution of the defect replacement process is allowed, is recorded.

3. An information recording medium according to claim 1, wherein non-real-time data is recorded as the user data in each of one or more sectors of the plurality of sectors, non-real-time reproduction not being required for the

non-real-time data, and

in each of the one or more sectors, defective replacement allowance attribute data having a second attribute value indicating that the recording of the user data has been executed in the state that the execution of the defect replacement process is allowed, is recorded.

4. An information recording medium according to claim 1, wherein the defective area is an ECC block including a defective sector, and the defect replacement process is executed in units of an ECC block.

5. An information recording medium according to claim 1, wherein recording of information into the information recording medium is executed in units of an ECC block, the ECC block including a plurality of sectors, and

attribute values of all defect replacement allowance attribute data included in the plurality of sectors in the ECC block are set to the same attribute value.

6. An information recording method for recording information into an information recording medium including a user area, and a spare area including a replacement area, wherein the replacement area may be used instead of a defective area in the user area,

wherein the user area and the spare area include a plurality of sectors; and

each of the plurality of sectors includes a user data area for recording user data, and an attribute data area,

the information recording method comprising the steps of:

- (a) recording user data into the user data area;
- (b) generating defect replacement allowance

attribute data; and

(c) recording the defect replacement allowance attribute data into the attribute data area,

wherein the defect replacement allowance attribute data indicates whether recording of the user data has been executed in a state that the execution of a defect replacement process is allowed, wherein in the defect replacement process, the defective area in the user area is replaced with the replacement area in the spare area.

7. An information recording method according to claim 6, wherein the step (a) includes the steps of:

recording real-time data as the user data in the user data area, real-time reproduction being required for the real-time data; and

continuing the recording of the real-time data without performing the defect replacement process, even when a defective area is detected during recording of the real-time data, and

the step (b) includes the step of:

setting an attribute value of the defective replacement allowance attribute data to a first attribute value indicating that the recording of the user data has not been executed in the state that the execution of the defect replacement process is allowed.

8. An information recording method according to claim 6, wherein the step (a) includes the steps of:

recording non-real-time data as the user data in the user data area, real-time reproduction not being required for the non-real-time data; and

executing the defect replacement process, when a defective area is detected during recording of the non-

real-time data, and

the step (b) includes the step of:

setting an attribute value of the defective replacement allowance attribute data to a second attribute value indicating that the recording of the user data has been executed in the state that the execution of the defect replacement process is allowed.

9. An information recording method according to claim 6, wherein the defective area is an ECC block including a defective sector, and the defect replacement process is executed in units of the ECC block.

10. An information recording method according to claim 6, wherein recording of information into the information recording medium is executed in units of an ECC block, the ECC block including a plurality of sectors, and

the information recording method further comprises the step of:

setting attribute values of all defect replacement allowance attribute data included in the plurality of sectors in the ECC block to the same attribute value.

11. An information reproduction method for reproducing information recorded on an information recording medium including a user area, and a spare area including a replacement area, wherein the replacement area may be used instead of a defective area in the user area,

wherein the user area and the spare area include a plurality of sectors,

the information reproduction method comprises the steps of:

(a) reading out data recorded in the information

recording medium;

(b) determining whether a read-out error of the data occurs;

(c) reading out defect replacement allowance attribute data from a sector, the data being recorded in the sector, when it is determined that a read-out error of the data occurs; and

(d) executing an error process depending on an attribute value of the read-out defect replacement allowance attribute data,

wherein the defect replacement allowance attribute data indicates whether recording of the data has been executed in a state that the execution of a defect replacement process is allowed, wherein in the defect replacement process, the defective area in the user area is replaced with the replacement area in the spare area.

12. An information reproduction method according to claim 11, wherein the step (d) includes the steps of:

(d-1) determining whether the attribute value of the read-out defect replacement allowance attribute data is equal to a first attribute value indicating that the recording of the user data has not been executed in the state that the execution of the defect replacement process is allowed; and

(d-2) ignoring the read-out error of the data and continuing a reproduction process, when it is determined that the attribute value of the read-out defect replacement allowance attribute data is equal to the first attribute value.

13. An information reproduction method according to claim 12, wherein the step (d-2) includes the step of:

replacing at least a portion of the data with predetermined dummy data.

14. An information reproduction method according to claim 11, wherein: each of the plurality of sectors includes a sector header;

the sector header includes the defect replacement allowance attribute data, and a sector header error detection code for detecting a read-out error of the sector header; and

the step (c) includes the steps of:

(c-1) detecting the read-out error of the sector header using the sector header error detection code; and

(c-2) reading out the defect replacement allowance attribute data from a sector, the read-out error of the sector header not being detected from the sector.

15. An information reproduction method according to claim 11, wherein: recording of data into the information recording medium is executed in units of an ECC block, the ECC block including a plurality of sectors;

the step (c) includes the step of:

(c-1) reading out one or more defect replacement allowance attribute data from one or more sectors of the plurality of sectors included in the ECC block, the data being recorded in the ECC block; and

the step (d) includes the step of:

(d-1) executing an error process depending on an attribute value of the read-out one or more defect replacement allowance attribute data.

16. An information reproduction method according to

claim 15, wherein: each of the plurality of sectors includes a sector header;

the sector header includes the defect replacement allowance attribute data, and a sector header error detection code for detecting a read-out error of the sector header; and

the step (c-1) includes the steps of:

(c-1-1) detecting the read-out error of the sector header using the sector header error detection code; and

(c-1-2) reading out the defect replacement allowance attribute data from at least one sector successively from a leading sector, the read-out error of the sector header not being detected.

17. An information reproduction method according to claim 16, wherein the step (d-1) includes the step of:

(d-1-1) determining whether the error process is executed based on majority rule of the attribute values of at least one defect replacement allowance attribute data, the read-out error of the sector header not being detected from at least one sector including the at least one defect replacement allowance attribute data.

18. An information reproduction method according to claim 15, wherein each of the plurality of sectors includes the defect replacement allowance attribute data, an internal code PI for correcting an error in one sector, and an external code PO for correcting an error over one ECC block,

the step (c-1) includes the steps of:

(c-1-1) detecting an error not correctable in one sector using the internal code; and

(c-1-2) reading out the defect replacement allowance attribute data from at least one sector successively from a leading sector, the error not correctable in one sector not being detected.

19. An information reproduction method according to claim 18, wherein the step (d-1) includes the step of:

(d-1-1) determining whether the error process is executed based on majority rule of the attribute values of at least one defect replacement allowance attribute data, the error not correctable in one sector not being detected from at least one sector including the at least defect replacement allowance attribute data.

20. An information reproduction method for reproducing information recorded on an information recording medium including a user area, and a spare area including a replacement area, wherein the replacement area may be used instead of a defective area in the user area,

wherein the user area and the spare area include a plurality of sectors,

the information reproduction method comprising the steps of:

determining whether a format of data recorded in the information recording medium is a predetermined format;

reading out defect replacement allowance attribute data from a sector, the data being recorded in the sector, when it is determined that the format of data recorded in the information recording medium is the predetermined format; and

determining whether reproduction of data recorded in the information recording medium is allowed, in accordance with an attribute value of the read-out defect

replacement allowance attribute data, and

the defect replacement allowance attribute data indicates whether recording of the data has been executed in a state that the execution of a defect replacement process is allowed, wherein in the defect replacement process, the defective area in the user area is replaced with the replacement area in the spare area.